THE FIRE LINE

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THE FIRE LINE

Fond du Lac Fire/Rescue Monthly Newsletter

FOND DU LAC FIRE / RESCUE

FROM THE BALCONY

A message from Chief Peter O'Leary

Leadership Under The Surface

On October 31, 1988 I walked into the St. Charles, IL Fire Department dressed up like a firefighter on Halloween, the only thing was, I was walking in as a firefighter and not in costume. On that day 30 years ago, I began down a path which has now stretched 30 years. I can vividly recall that morning and how incredible I felt knowing that I finally got a chance to start my fire service career. I am pretty certain I woke up every hour making sure I didn't oversleep. I had driven the course many times and knew exactly which route I would take and how long it would take me to arrive at the firehouse. I think about that beginning often and especially when interviewing potential members of our agency and wonder if they will have the same feelings and will they last their entire careers.

I am lucky, as I have said more times than I can count. I have had the good fortune to have worked in the fire service for 39 years (first nine as a paid-on-call member). I could not imagine another profession which is as fulfilling as that of a firefighter. I have met some incredible people along the way and made lifelong friends in the process. In more difficult times it has been those firehouse friends that have picked me up, listened and helped to make sense of some of the most difficult times I encountered along the way. At times I feel I have not done enough but then I am reminded by the people who we serve just how much they appreciate and honor our profession and that means the world to me.

I have been mentored by some of the very best leaders I could ever have imagined. Their steadfast guidance and good counsel allowed me to take chances without the threat of complete failure. In turn, I hope I have helped to develop good firefighters, paramedics, engineers, company officers, captains, chief officers and most importantly, good-minded caring people.

Throughout the last 30 years, I have encountered several people that have challenged me and caused me to step back and look deeper into the individual and dig down to find how their energy and commitment could be better utilized to benefit our organization.

Sometimes as leaders, we have to take a chance on someone even when everything on paper tells us not to invest in them.

Continued on the next page...

INSIDE THIS ISSUE:

UPCOMING TRAINING AND EVENTS

Recruit Academy >
Continuing until Dec. 11

Stop the Bleed Presentations >
Marian University & SSM Health

Holiday Parade of Lights
Saturday, Dec. 1 > 4:15pm

FROM THE BALCONY, Continued

A message from Chief Peter O'Leary

Leadership Under The Surface, Cont.

One leader I saw buried underneath years of distrust, anger and unhappiness "greeted" me when I was moving my personal belongings in my office a day or two before I began my tenure as fire chief in Fond du Lac. I would like to say this was the first time it ever happened, that was not the case. I felt some of the pushback when I began my tenure in Durham, NH.

That January day in Fond du Lac, I left the station wondering what was I going to do to change that guy's attitude and would it even be possible. Fast forward a few years and that opportunity came around full circle when I convinced him he was the right person to lead our fire prevention bureau. Some people thought I was crazy and they let me know it! Some of my colleagues at city hall even questioned my decision-making, but by the time I made the offer, I knew he would succeed and he did. Last week, Division Chief Troy Haase was named the Wisconsin Fire Inspector of the Year. His wife, parents and some of his co-workers were in attendance to see him receive the award, but I would argue none were more proud of Troy's accomplishment than me. The Troy Haase I met almost 10 years ago had changed and he has set a standard of professionalism in our fire prevention bureau which should be a model for others to see.

It's not always the easy path that reaps the greatest yield. I tend to like the underdog, the person who you never need to check their pulse and who has the energy and desire to be better. Take time to lead, gain better understanding and take chances on people; you might end up with a success story like I did which has been one of them most treasured aspects of my fire service career.

Until next month,
Stay Safe and Be Well.

Chief O'Leary celebrates 30 years of firefighting service!

Peter O'Leary had his first day on the job as a paid firefighter on October 31, 1988 in St. Charles, IL fulfilling the dream he had back in the first grade when he told a local news reporter that he wanted to be a firefighter when he grew up. Pete worked there for 3 years when he was given the opportunity to return to his hometown of Wheaton, Il. To be able to go full circle and work in the town where his career truly began, as a paid on call firefighter starting when he was a senior in high school, was very special to Pete. He worked in Wheaton for 14 years moving up the ranks to Lieutenant and then Battalion Chief. Pete left Wheaton in 2006 to become the Fire Chief in Durham, New Hampshire where he was able to experience the political climate first hand which he found very interesting. He was able to meet two former US Presidents, Bill Clinton and George W. Bush, along with many other high ranking political figures. Pete came back to the Midwest in January of 2009 when he was named the City of Fond du Lac Fire Chief. Chief O'Leary finds his position both personally and professionally rewarding. The accolades the department has received, including IS0 Class 1, agency accreditation status, along with the quality of work which comes out of the department has been extremely fulfilling. Chief states "the team has set the bar so high it will be fun to see how high they truly take it". Watching people develop into true leaders has also been rewarding. Chief says that it is easy to come to work with the group of talent that he is surrounded with every day. His desire as a first grader was spot on - *Congratulations on 30 years of firefighting Peter O'Leary!*

Fond du Lac Fire Rescue Operations

By: Assistant Chief Erick Gerritson

Safe apparatus operation, the next firefighter safety initiative

Implement initial and continuous training on emergency vehicle operation SOGs, vehicle dynamics and defensive driving to combat the second greatest cause of firefighter LODDs.

Firefighter health and safety initiatives have taken many forms in recent years. Operational safety initiatives focus on accountability in proper PPE usage and decontamination. Firefighter wellness programs call for annual physicals and a regular exercise regimen for improving cardiovascular circulation and physical endurance. And behavioral health initiatives drive us to take responsibility for one another to make sure our firefighters seek professional help for conditions such as PTSD, depression and chemical dependency.

The responsibility of safely driving an emergency vehicle, however, is just as important to the wellbeing of firefighters as any of these other initiatives. Fire apparatus crashes account for 25 percent of firefighter line of duty deaths, second only to medical emergencies such as heart attacks and strokes, which account for 42 percent of LODDs.

FIRE APPARATUS STANDARD OPERATING GUIDELINES

Most fire departments have Standard Operating Guidelines that cover the major aspects of driving apparatus:

- The use of warning lights and sirens.
- The safe maximum speed of an emergency vehicle.
- The need for an assigned spotter when backing up or turning a vehicle around.
- How to approach an intersection with a red traffic light or stop sign.
- How to properly use an emergency vehicle to create a safe zone blocking traffic lanes while operating at a motor vehicle crash.
- The mandatory use of seatbelts in all fire department vehicles. Seatbelt use has proven to reduce the number of injuries in motor vehicle crashes. All newer department vehicles have been fitted with seatbelt alarms that alert an officer when one of the firefighters has failed to buckle-up.

These guidelines should cover the operation of all department apparatus and personal vehicles used for emergency response.

Many states have traffic laws that include a "due regard or diligence" clause that reinforces the requirement for both the driver of an emergency vehicle and the officer in charge (OIC) to act with a sense of caution as they approach other vehicles in traffic.

INITIAL APPARATUS DRIVING TRAINING AND EDUCATION

In addition, most states have mandatory training, such as an Emergency Vehicle Operator's Course (EVOC) that stresses driver safety, within their Firefighter I or Firefighter II training requirements. Over and above those requirements, some state training academies now offer courses using state-of-the-art driving simulators that can add a new dimension of realism to this training.

The initial EVOC should include a minimum of four hours in the classroom on the departments SOGs, including the legal aspects of vehicle operations, and defensive driving that includes vehicle dynamics (e.g., stopping distances). Aerial truck operators should undergo a separate process that includes not only driving, but also set-up for stabilizing the vehicle before deploying the aerial ladder; and safety considerations (e.g., overhead wires, ladder angles and tip loads).

Fond du Lac Fire Rescue Operations

By: Assistant Chief Erick Gerritson

Safe apparatus operation, the next firefighter safety initiative, continued

CONTINUOUS APPARATUS OPERATION TRAINING AND EVALUATION

In addition to the initial EVOC for new emergency vehicle operators, veteran drivers should have an annual classroom refresher, followed by a behind-the-wheel obstacle course that includes backing into a limited space. Drivers who have been off-duty for more than six months due to a leave of absence, illness or injury should undergo this refresher training before returning to full driver status.

Departments should also conduct an annual driver's license check, looking back at least three years. Major traffic violations (e.g., driving under the influence of alcohol or drugs, reckless operation or vehicular homicide/assault) should result in an immediate suspension of driving privileges.

PRE-EMPTIVE TRAFFIC SYSTEMS

No matter how effective a pre-emptive traffic system may be in your jurisdiction, apparatus operators must always consider the unknown. Sometimes, civilian drivers panic. Sometimes, individuals believe the siren may be in response to something they've done. In either case, these drivers may, at the last minute, speed through an intersection directly into the path of an emergency vehicle.

Even after being assured that your apparatus has captured the pre-emption system, it is advisable to slow down and be ready for the unknown at any intersection.

FIRE APPARATUS ACCIDENT INVESTIGATION

Every accident involving emergency vehicles that causes damage – no matter how seemingly insignificant – should be investigated. At minimum, statements need to be taken from the operator and the officer in command of the apparatus, along with a police report when warranted. Results of the accident investigation should become a part of those individuals' personnel records.

If an accident also involves a private vehicle or pedestrian, no matter who may appear at fault, many legal counsels recommend that the operator should be sent for a blood test to screen for alcohol or drug use.
Check with your department attorney first, but these steps will help demonstrate a proactive defense in the event of a serious crash. A proactive defense, paired with safe driving practices, illustrates a pattern within your department that confirms a culture of safe apparatus operation.

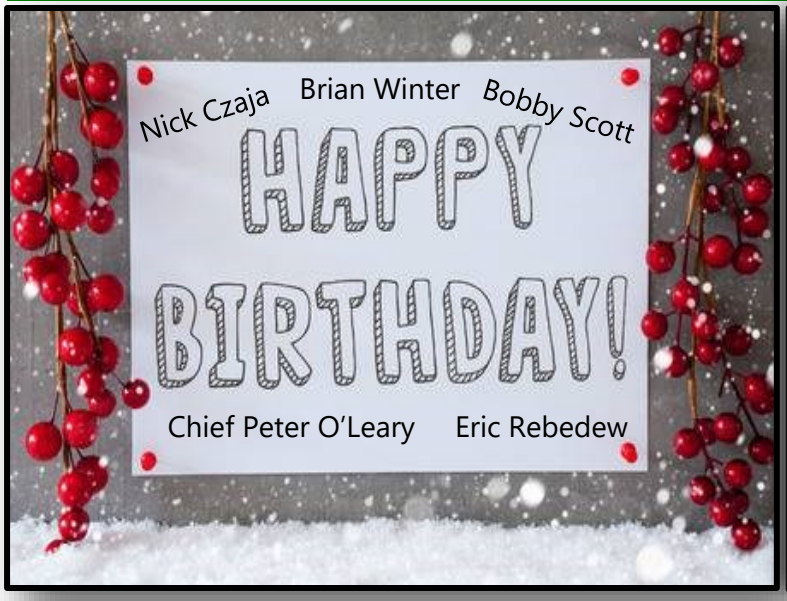
Safe driving programs are designed to save you and your crew from injury or death, and allow everyone to go home – the premise of all our 16 Firefighter Life Safety Initiatives.

Article from Fire Rescue 1, by Robert Rielage

Until next month, Stay Safe!!

OPERATIONS BY THE NUMBERS

OCTOBER	*THIS MONTH*		*YEAR–TO–DATE*	
PREVENTION	LAST YEAR	THIS YEAR	LAST YEAR	THIS YEAR
Total Inspections	251	240	2584	2545
Total Defects	261	162	3073	1750
SUPPRESSION				
Alarms Involving Fire	20	8	109	118
Fire Mutual Aid Given	0	4	12	15
Fire Mutual Aid Received	0	0	0	0
Service/Good Intent Calls	31	38	373	469
False Alarms & False Calls	38	29	264	260
Other Calls	14	15	142	139
Total Fire Alarms & Calls	103	90	888	985
EMS				
Total Ambulance Calls	466	516	4832	5068
Total Fire & Ems Responses	569	606	7919	6053
Fire Property Loss	$1,750.00	$500.00	$136,396.00	$379,665.00
Fire Contents Loss	$14,500.00	$0.00	$120,361.00	$149,260.00
Engine Assisted EMS Calls	203	202	2197	2126



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At City of Fond du Lac Fire/Rescue

The Code Summary

By: Todd Janquart
Assistant Chief of EMS

Taking a Manual Blood Pressure: Techniques and Pitfalls

One of the procedures that we often take for granted is obtaining a manual blood pressure. While simple, it is easy to forget the process and pitfalls because so much of our assessment tools are automatic. As EMS providers, we are all versed in the knowledge and can recognize when someone performs this procedure incorrectly but how well do you recall the exact methodology in performing this procedure correctly? Simple detail such as selecting the proper size cuff and how fast/slow to release the cuff pressure are often forgotten. The article below is a good reminder from the days of your primary EMS training.

Follow the steps below in order to get the best results from use of the aneroid sphygmomanometer when measuring a patient's blood pressure, taking care to avoid some common errors.

1. **Properly expose the patient.**

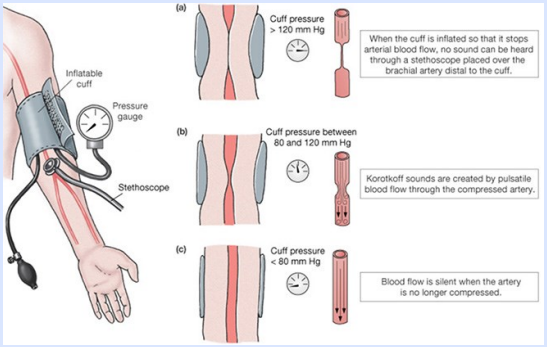
The blood pressure should be measured during the secondary examination, which begins with exposing the patient. This will ensure that the cuff is placed on the skin. The blood pressure cuff should never be placed over clothing, as doing so will increase pressure on the cuff and produce an inaccurate reading.

2. **Properly position the patient.**

The patient should be seated comfortably, with the legs uncrossed. The artery used to measure the blood pressure should be close to the level of the heart, with the arm supported.

3. **Select the appropriate cuff.**

A cuff should be selected that's able to completely encircle the patient's upper arm with 80% of the cuff. If it takes more than 80% of the cuff to encircle the upper arm, the cuff is too small for the patient, and will produce a reading that's higher than accurate. If it takes less than 80% of the cuff to encircle the upper arm, the cuff is too large, and will produce a reading that's lower than accurate.



4. **Palpate the artery.**

With the arm fully extended, feel for the pulsation of the brachial artery. Failure to fully extend the arm will result in difficulty both in locating the artery and in auscultating Korotkoff sounds. In most people, the pulse can be felt at the medial aspect of the antecubital fossa, where the artery comes closest to the skin.

5. **Properly position the cuff.**

The lower margin of the cuff should be positioned 1 inch above the point where the pulse was located, and should be snug to the arm. In actual practice, it's difficult to make the cuff too tight to the arm; it's quite easy to make it too loose. Locate where the bladder is sewn into the cuff, and ensure that the bladder is positioned over the artery in order to properly occlude blood flow when the cuff is inflated.

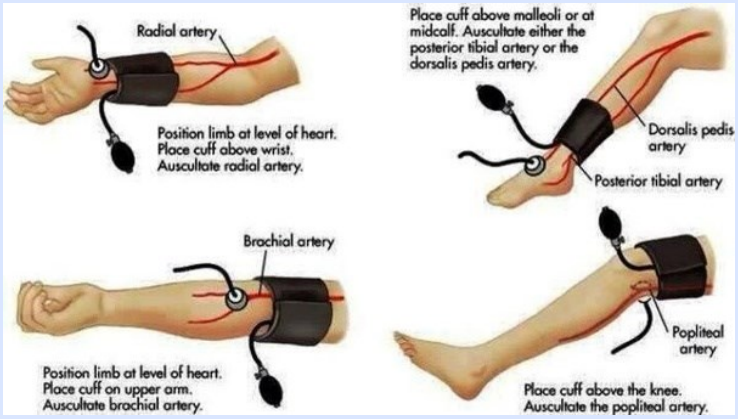
The Code Summary

By: Todd Janquart
Assistant Chief of EMS

6. **Use palpation to estimate the systolic blood pressure.**

While palpating the radial pulse, inflate the cuff until the pulse disappears. Release the pressure until the pulse returns, and note the reading on the sphygmomanometer at this point. This is your palpated systolic blood pressure.

Note that many EMS professionals and clinicians skip this step in favor of obtaining an immediate auscultated pressure, which can lead to an underestimation of the systolic blood pressure in the presence of an auscultatory gap—a condition in which Korotkoff sounds disappear for a range of up to 30 mmHg before reappearing. Typically noted during Phase 2, the auscultatory gap has been associated with serious vascular disease and chronic hypertension. As with pericardial tamponade, only through the use of an aneroid sphygmomanometer are we able to observe this clinically significant finding, which in turn can inform our diagnostic decisions.



7. **Inflate the cuff to 30 mmHg above the palpated systolic pressure.**

You should strive to inflate the cuff to 30 mmHg above the palpated systolic pressure—no more and no less. This avoids both under- and over-inflating the cuff.

8. **Slowly release the pressure while looking straight-on at the sphygmomanometer.**

Looking at the face of the manometer at an angle can result in parallax error—an inaccurate measurement due to optics.

References

1. Blank SG, West JE, Müller FB, et al. Characterization of auscultatory gaps with wideband external pulse recording. Hypertension. 1991;17(2):225–233.
2. Cavallini MC, Roman MJ, Blank SG, et al. Association of the auscultatory gap with vascular disease in hypertensive patients. Ann Intern Med. 1996;124(10):877–883.

Article by Mark Rock in the October 24th, 2018 online edition of JEMS magazine.

Mark Rock, NRP, is an assistant professor of emergency medical education at Palomar College in Escondido, California, where he's currently developing a new model for patient assessment.

The secret of getting ahead is getting started. Mark Twain

2018 Wisconsin Fire Inspector of the Year
Division Chief Troy Haase

Division Chief Troy Haase was named *"Fire Inspector of the Year"* by the Wisconsin Fire Inspector's Association at its annual Awards Dinner held at the Radisson Conference Center in Green Bay.

Division Chief Haase was nominated for the award by Chief Peter O'Leary. "Troy has done a remarkable job seeking code compliance through education" stated Chief O'Leary. "Through Division Chief Haase's leadership and drive, we have an agency with over 60 state certified inspectors. Troy has a vision for excellence in all aspects of fire prevention which has reduced fire risk in our community. I could not think of anyone more deserving of this award."

DC Haase accepted the award stating - "It's a great honor to receive this award and I truly appreciate it" said, Troy Haase. "This award is a true reflection of a team effort by all the members who represent Fond du Lac Fire Rescue who deliver quality fire prevention and education to the public on a daily basis. I humbly share this honor with all of them."

Troy's wife Angie, his parents Bill and Judy, along with other members of the Fire/Rescue Command Staff joined in the celebration of this prestigious award.

Congratulations, Troy!

FOND DU LAC EST. 1848 FIRE / RESCUE

December is the peak time of the year for home candle fires. Forty-two percent of decoration fires happen because decorations are placed too close to a heat source.

Winter holidays are a time for families and friends to get together. But that also means a greater risk for fire. Following a few simple tips will ensure a happy and fire-safe holiday season.

- *Be careful with holiday decorations. Choose decorations that are flame resistant or flame retardant.*
- *Keep lit candles away from decorations and other things that can burn.*
- *Keep children and pets away from lit candles.*
- *Blow out lit candles, turn off all light strings and decorations before leaving home or going to bed.*
- *Think about using flameless candles in your home. They look and smell like real candles.*

Lit candles are used in religious services, in places of worship, and in the home. Whether you are using one candle, or more than one on a candelabra, kinara, or menorah, make sure you take a few moments to learn about using candles safely.

Well trained people are the best defense against fire.

By: James Knowles III
Assistant Chief Training/Safety

First Due Deck Gun

The deck gun might be a regional term, I have also heard it called the monitor, but we are talking about the engine mounted master stream. Most engine mounted master streams, fog, or a stack of smooth bore tips have a flow range of 500 to 1000 GPM.

Before we go big guns blazing we can review our first due fire attack options. The 1 ¾" flowing 2.5 gallons per second is a rapidly deployed and highly mobile attack line for a room or rooms of fire. The 2 ½" attack line flowing 5 gallons per second is our heavy weight fighter looking for the big knockdown against the big opponent of a full residential floor on fire, commercial occupancy fire or any of the ADULTS situations. Finally we have the deck gun for those marginal situations where you arrive to find up to an entire building on fire and the rapid application of your whole or partial tank at 10 gallons per second is required to nuke the fire's progress and prevent extension to exposure occupancies.

In these master stream situations it is my personal opinion they should be a smooth bore. These streams will be exterior where they will be influenced by wind, large bodies of fire will require greater stream penetration and set backs or positioning challenges for the engine mounted stream push us to maximize our stream reach and accuracy.

Smooth Bore Tip Sizes and Stream Volume at 80psi

1 3/8" = 500 GPM 1 ½" = 600 GPM 1 ¾" = 800 GPM 2" = 1000 GPM

When a smooth bore of these diameters are used as master streams the operating pressure is typically 80psi. Most of the times when engines are set up with stacked tips I find that a full 4 tip or "quad stack" is in place with the 1 3/8" on top. The two main reasons for this are "because they came that way" or because the engine has a 500 gallon tank and to use a 500 GPM tip would give nearly a minute of operation before a supply is needed.

I personally recommend the 1 ½" tip as the first up for the first due deck gun. Having tried this on a variety of different engines I have found this 10 gallon per second stream to be the highest volume, best quality stream that can be delivered strictly from tank supply. As you begin to move to the 1 ¾" and 2" tips a lot is being asked of the unsupported pump and internal plumbing and the larger tip size also reduces the stream reach and pin point accuracy that you find in the 1 ½" tip.

The Set Up

The appropriate tip is the first part of the first due deck gun set up, flow control at the monitor is second. Having a valve at the tips and more specifically a gate valve has several benefits. Flow control at the monitor reduces the potential for wasting water during positioning. It allows you to open the master stream valve at the panel and charge up to the monitor valve at idle then throttle up. Anyone who has attempted to open that larger, less frequently used valve under pressure can appreciate this. It also sets the stage for a single person to serve as both pump and master stream operator.

In lightly staffed organizations with 1 or 2 man engines this is important but also in fully staffed engine companies the efficiency of the pump operator making a quick knock down while the other members are making a stretch. Utilizing a gate valve in this set up over a ball valve reduces the overall length of the set-up and due to the design of the gate versus the ball valve it eliminates the potential of a water hammer due to rapid valve closure.

Well trained people are the best defense against fire.

By: James Knowles III
Assistant Chief Training/Safety

First Due Deck Gun, continued

Once the deck gun itself is set up with tips and a valve be sure to operate in all potential positions. It is important that any obstructions or limitations are identified prior to the fire. The devil is in the details here as even the location of a light can now dictate how you position the apparatus to use the tool in a specific situation.

The final step in the set-up process is predetermining our pump discharge pressure (PDP) for this operation and it can only be done by flowing water. The PDP can be rig specific, even the slightest differences in plumbing, valves and or location can swing the friction loss by 20 PSI at this volume. Once you are flowing at the appropriate PDP close the gate valve at the deck gun and record your static pressure. For this engine we found that the static pressure was 140 to achieve the 80 PSI at the deck gun gauge once the valve was fully opened. This was not confirmed by a flow meter which would be the optimal way to pre-plan, however it will serve as an example.

By having flow control at the deck gun and knowing the static pressure the pump operator can quickly engage the pump upon arrival, pull the tank to pump valve, open the master stream valve and throttle up to that 140 PSI static pressure. This ensures that when the firefighter manning the deck gun or the pump operator jumps up to operate it they will know that the appropriate pressure is being supplied immediately upon opening the gate valve.

Operation

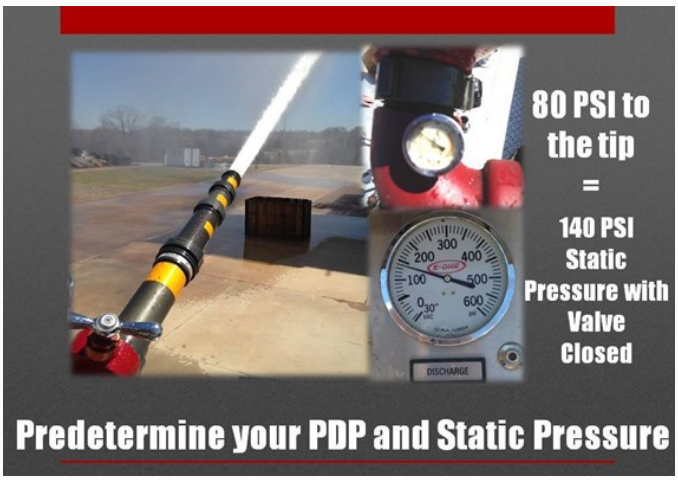
The hard work is done in the set-up, the operation is as simple as Ready, Aim and Fire.

Ready is getting the pump set up, master stream panel valve opened and throttling up to the required static pressure.

Aim is setting up the deck gun in the appropriate position for the target if the one on your engine has a high and low set up. Then sighting in the tips for the target. Fire is opening the gate valve and delivering that high quality, fire killing, H2O at 10 gallons per second to the involved occupancy.

Practice

Learning the reach and arch of the stream, and the mechanisms to adjust the monitor take some repetitions but it pays huge dividends. If we are choosing to go big at 10 gallons per second from our tank upon arrival in an attempt to take control of a rapidly changing situation we cannot afford to waste 10 to 20 seconds of water getting our pressures or our aim right. Getting good at going big with the first due deck gun happens in training.



Source: Brush, B., (2018). First due deck gun. Black Helmet Brotherhood. Retrieved from: http://www.blackhelmetbrotherhood.com/first-due-deck-gun/

News from the Station

Military Send-Off for Firefighter/Paramedic Brett Hefty

FDL Fire/Rescue offered support and encouragement to Firefighter/Paramedic Brett Hefty in a military send-off held at Station 1. Hefty, a Sargent in the Wisconsin Army National Guard, has been deployed to Afghanistan to assist the national army there.

New Recruits!

Please meet the newest members of Fond du Lac Fire Rescue. From Left to Right: Heather Shoemaker, Connor Knaus, Max Blitzke and Zachary Mueller. The newest Recruit Academy began on Monday, November 12th. *Welcome to FDLFR!*

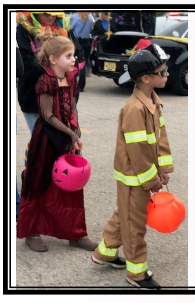
The fire engine exhibit at the Children's Museum is open to the public! Thank you to all that came to the ribbon cutting and to the community partners that came together to make it possible!

Captain Joe Maramonte accepts a donation of fire alarms and CO detectors from the call center employees at Charter Communications. Thank you Charter for helping us help our community!

Children at Evans Elementary School were paid a visit by Fond du Lac Firefighters who talked to the children about fire safety and showed the children what firefighters look like when they are in their firefighting great. These visits are invaluable to help us gain trust with children just in case they encounter us during an emergency.

Fall Election 2018

Long lines of people waiting to vote was the normal throughout the day on November 6th. Wards 5 & 6 in the City use Station 1 as their voting headquarters.



FDL Fire/Rescue participated in the Trick Your Trunk event held at the FDL Rec. Dept.

FIRE PREVENTION ....

That's what it's all about!

By: Troy Haase
Division Chief of Fire Prevention

Home Fires Involving Heating Equipment

In 2011-2015, U.S. fire departments responded to an estimated average of 54,030 structure fires per year in homes that involved heating equipment. These fires resulted in average annual losses of 480 civilian deaths, 1,470 civilian injuries, and $1.1 billion in direct property damage. These homes included one- and two-family homes (including manufactured homes) and apartments (including townhouses and other multi-family dwellings).

Heating equipment is a leading cause of fires in U.S. homes. Heating equipment caused 15% of home structure fires in 2011-2015, ranking as the second leading cause behind fires caused by cooking equipment. Home heating equipment fires also accounted for nearly one-fifth (19%) of civilian deaths (third behind fires caused by smoking materials and cooking), 12% of civilian injuries (second behind cooking equipment), and 16% of direct property damage (third behind electrical distribution and lighting equipment and cooking equipment).

Home Structure Fires Involving Space Heaters

Space heaters account for the vast majority of civilian deaths and injuries associated with home structure fires involving heating equipment, as well as just over half of the direct property damage. In the 2011-2015 period, there were an estimated average of 23,000 home structure fires involving space heaters per year, resulting in 410 civilian deaths, 1,140 civilian injuries, and $565 million in direct property damage. Non-confined fires accounted for all of the civilian deaths and nearly all of the civilian injuries and direct property damage from these incidents.

Home Structure Fires Involving Fireplaces, Chimneys, and Chimney Connectors

In the 2011 to 2015 period, there were an estimated annual average of 16,810 home structure fires involving fireplaces, chimneys, and chimney connectors, resulting in an estimated 30 deaths, 90 civilian injuries, and $262 million in direct property damage per year. Fires involving fireplaces, chimneys, and chimney connectors comprised 31% of the 2011-2015 home fires involving heating equipment, as well as 6% of the associated civilian deaths, 6% of civilian injuries, and 25% of direct property damage. The vast majority of these fires (94%) involved solid-fueled equipment, which accounted for 85% of civilian deaths, 88% of civilian injuries, and 79% of direct property damage.

Home Structure Fires Involving Central Heating Units

In 2011-2015, there were an estimated average of 6,130 home structure fires per year that involved central heating units. These fires resulted in an estimated 20 civilian deaths, 70 civilian injuries, and $75 million in direct property damage each year. The fires involving central heating units comprised 11% of the home structure fires involving heating equipment during this period, as well as 4% of civilian deaths, 5% of civilian injuries, and 7% of direct property damage arising from home heating equipment fires.

Home Structure Fires Involving Water Heaters

In 2011-2015, there were an estimated average of 5,200 home fires involving water heaters each year, resulting in annual losses of 10 civilian deaths, 130 civilian injuries, and $104 million in direct property damage. Half (50%) of these fires involved electric-powered equipment, accounting for 18% of civilian injuries and 33% of the direct property damage. Gas fueled water heaters were involved in nearly as many of the fires (49%), but were associated with all the civilian deaths, 82% of civilian injuries and 66% of direct property damage.

Source: Richard Campbell, NFPA, "Home Fires Involving Heating Equipment", December 2017, Web November 14, 2018.

FIRE PREVENTION ....

That's what it's all about!

By: Troy Haase
Division Chief of Fire Prevention

Home Fires Involving Heating Equipment, continued

Heating Safety Tips

- Keep anything that can burn at least three-feet away from heating equipment, like the furnace, fireplace, wood stove, or portable space heater.
- Have a three-foot "kid-free zone" around open fires and space heaters.
- Never use your oven to heat your home.
- Have a qualified professional install stationary space heating equipment, water heaters or central heating equipment according to the local codes and manufacturer's instructions.
- Have heating equipment and chimneys cleaned and inspected every year by a qualified professional.
- Remember to turn portable heaters off when leaving the room or going to bed.
- Always use the right kind of fuel, specified by the manufacturer, for fuel burning space heaters.
- Make sure the fireplace has a sturdy screen to stop sparks from flying into the room. Ashes should be cool before putting them in a metal container. Keep the container a safe distance away from your home.

• Test smoke alarms and CO alarms at least once a month.

Source: National Fire Protection Association

FACT SHEET » RESEARCH

U.S. Home Heating Equipment Fires

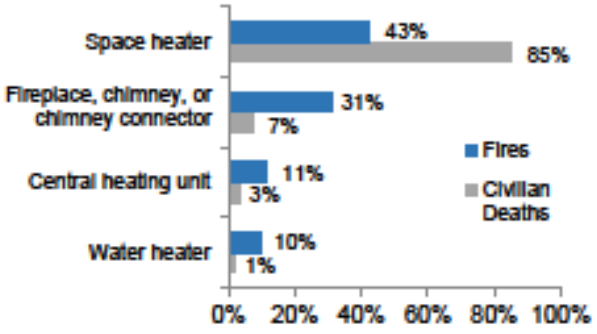
In 2011–2015, U.S. fire departments responded to **54,030** home[1] structure fires that involved heating equipment.

These fires caused:

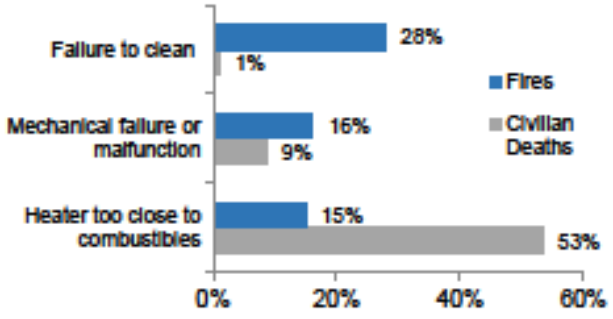
- 480 civilian fire deaths
- 1,470 civilian fire injuries
- $1.1 billion in direct property damage

- ▸ Heating equipment fires accounted for 15% of all reported home fires in 2011–2015 (second behind cooking) and 19% of home fire deaths.
- ▸ The leading factor contributing to home heating fires (28%) was failure to clean, principally from solid-fueled heating equipment, primarily chimneys.
- ▸ The leading factor contributing to ignition for home heating fire deaths (53%) was heating equipment too close to flammable items, such as upholstered furniture, clothing, mattress, or bedding.
- ▸ Most home heating fire deaths (85%) involved stationary or portable space heaters.
- ▸ Nearly half (48%) of all home heating fires occurred in December, January, and February.
- ▸ The number of home heating fires peaked in the hours between 5 p.m. to 9 p.m.

U.S. Home Heating Fires by Equipment Involved: 2011–2015



Leading Factors in Home Heating Fires 2011–2015



[1]Homes are dwellings, duplexes, manufactured homes, apartments, townhouses, row houses, and condominiums.

Source: NFPA Research: www.nfpa.org/research
Contact information: 617-984-7450 or research@nfpa.org

NATIONAL FIRE PROTECTION ASSOCIATION
The leading information and knowledge resource on fire, electrical and related hazards

FIRE PREVENTION ....

That's what it's all about!

By: Troy Haase
Division Chief of Fire Prevention

Current Status of New Construction

- The Brickhouse at 161 S. Main Street - Building is under construction.
- Mercury Marine at 600 West Pioneer Road- Building is under construction.
- CD Smith Corporate Offices on Camelot Drive- Building is under construction.
- Fond du Lac High School at 801 Campus Drive- Building is under construction.
- Mid-States Aluminum at 132 Trowbridge Drive- Building is under construction.
- The Church of Jesus Christ of Latter Day Saints at 347 Country Lane- Building is under construction.
- Fond du Lac Humane Society at 652 Triangle Road- Building is under construction.
- Menards at 1200 Rickmeyer Drive- Building is under construction.
- Fond du Lac Safety Training Center at 750 N. Rolling Meadows Drive- Building is under construction.
- McNelius Steel at 123 E. Larsen Drive- Building is under construction.
- Magic Car Wash Express at 123 West Johnson Street- Building is under construction.
- Mercury Marine at 545 W. Pioneer Road- Excavation is underway.
- Fairfield Inn at 935 S. Rolling Meadows Drive- Excavation is underway.
- River Hills Mixed Use Development on S. Main Street- Buildings 1, 2, 3, 4, 8 are complete and 5 & 6 are under construction.
- Fond du Lac County Highway Department - Excavation is underway.

PEER FITNESS TIPS

By: Peer Fitness Trainer
Jack Prall

Wearable Heart Rate Trackers: Which Works Best?

How accurate are the latest wearable heart rate trackers?

That's an important question amid the flourishing demand for wearable fitness devices and wrist-worn heart rate monitors. Approximately 1 in 6 consumers in the U.S. uses some type of wearable technology, such as a fitness band or a smartwatch. Industry research from 5 years ago predicted sales of 110 million wearable devices by 2018, but shipments of 115.4 million in 2017 have already outpaced that projection.

Historically, the most precise consumer heart rate monitors have used chest straps and electrode attachments. Today's most popular health and fitness trackers, however, use optical-sensing technology that goes beyond heart rate—potentially measuring changes in an organ or even the entire body. The technology is unlocking potential to monitor a range of health analytics data, including heart rate, body temperature, perspiration, oxygen saturation, physical activity and electrical activity of the skin.

Despite all these innovations, however, accuracy remains a paramount concern for exercise enthusiasts, athletes tracking personal progress and physicians monitoring heart rate for specific patient issues. A study last year explored this question, comparing the accuracy of five wearable heart rate trackers that use optical sensors.

Recent Findings on Accuracy of HR Monitors

Purpose. The study evaluated the precision of five optical-based heart rate–monitoring devices. Four are worn on the wrist: Apple Watch, Fitbit Blaze™, Garmin Forerunner® 235 and TomTom Spark Cardio. The Scosche® Rhythm+ is worn on the forearm.

Participants. Fifty aerobically active men and women (average age: 38; average BMI: 25 kg/m2) volunteered for the study. They were screened to ensure they could safely complete an 18-minute exercise protocol on a stationary bicycle, treadmill and elliptical trainer.

Methods. Each participant wore standard electrocardiograph (ECG) leads, a Polar H7 chest strap monitor and a Scosche Rhythm+ on the forearm. In addition, volunteers were randomly assigned to wear two kinds of wrist-worn heart rate monitors (one on each wrist). Thus, each of these four monitors was tested by 25 of the 50 participants. The study compared the accuracy of all devices against results from the ECG, which provides a visual display of the heart's electrical activity and measures heart rate with the greatest accuracy.

Exercise protocol. Participants completed a 4.5-minute light, moderate and vigorous exercise sequence (1.5 minutes at each intensity) on each of four pieces of equipment, assigned in a random order: treadmill, stationary bicycle, elliptical trainer with arm levers and elliptical without levers. Subjects rested 2 minutes after completing each modality test. In all, each participant exercised for 18 minutes in a 24-minute test. The researchers explained that they used multiple exercise machines, with three intensities on each machine, because their previous research had determined that new optical devices performed irregularly on various types of exercise equipment at mixed intensities.

Statistical results. The scientists used a specialized correlational approach to compare the accuracy of the devices to that of the ECG. An ECG correlation above 0.80 was considered acceptably accurate.

As expected, the Polar chest strap had the highest ECG correlation, averaging 0.99 on each modality. A comparison of the average correlations of the optical devices found that the Apple Watch performed best (average: 0.88), followed by the TomTom, Garmin, Scosche Rhythm+ and Fitbit (0.74, 0.67, 0.61 and 0.56, respectively).

PEER FITNESS TIPS

By: Peer Fitness Trainer
Jack Prall

Wearable Heart Rate Trackers: Which Works Best?, cont.

Discussion of the Results

The first-rate accuracy of the Polar chest strap monitor reflects decades of research and development spent refining this device. The chest strap is used because of its proximity to the heart. Athletes and researchers frequently use chest strap monitors; however, while straps are highly accurate, they are inconvenient for many consumer enthusiasts.

The newer heart rate monitors tested in this study use an optical technology known as PPG, short for photoplethysmography. These devices emit light signals on the skin and perform an optical scan that measures changes in the size of blood vessels just below the skin's surface. Software interprets these signals to estimate a user's heart rate. A PPG signal can be read pretty much anywhere on the body, including an earlobe, a wrist or even a finger.

As Gillinov and colleagues discuss, optical-based monitors have limitations. They're prone to errors caused by physical movements, misalignments between skin and sensor, variations in skin color/tone, and poor tissue perfusion. Optical-based wearables are less accurate than the Polar chest strap, and reliability varies quite a bit from one aerobic activity to the next. These findings suggest that fitness pros should inform clients that such devices are not the most precise tools for assessing, managing and implementing exercise programs.

Note that this study, completed in 2017, reflected the most recent technology available from respected manufacturers. Since optical technology is early in its development, we can assume that manufacturers are making advances with well-conducted research.

Best Practices: Bottom Line

Optical-based wrist-worn heart rate monitors vary in accuracy and perform differently based on the exercise modality. In this study, the Apple Watch came closest to matching the ECG for different modalities at light, moderate and vigorous intensities. However, for now, fitness pros should use the Polar chest strap if they want to test clients with the most accurate heart rate tracker available.

Additionally, until new research suggests otherwise, the best way to estimate maximum heart rate may be with one of these formulas: 206.9 – (0.67 × age) or 208 – (0.7 × age).

by Len Kravitz, PhD on Aug 21, 2018

Research A study explores the accuracy of five wearable heart rate trackers that use optical sensors.

Q&A: HEART RATE AND WEARABLE EXERCISE TECHNOLOGY

Why do people buy wearable fitness trackers?

Ideally, wearables can provide all-inclusive platforms for heart rate measurement during exercise. Clearly, consumers are embracing that ideal, although it remains somewhat out of reach because the technology is so new. Even with the current limitations, these devices can contribute to positive habit formation, stress management, and improvements in sleep, productivity and physical fitness.

What formula is best for estimating maximum heart rate?

Although the 220-minus-age estimated maximum heart rate calculation is easy to compute, it was never intended for the general population and is prone to considerable error. Foster & Porcari, in the ACE Personal Trainer Manual, recommend using two other formulas to estimate maximum heart rate; they have an error potential of about 7 beats per minute. Gellish et al. formula: 206.9 - (0.67 × age) Tanaka, Monahan & Seals formula: 208 - (0.7 × age).

How useful are the wearable devices in changing behavior?

While few randomized controlled studies have focused on the impact of wearable technology on health behavior change (Piwek et al. 2016), these monitors include goal-setting, self-monitoring and feedback content that closely matches recommendations for positive behavior change. Therefore, the future of this technology has broad applications for use in fitness, medicine, public health and rehabilitation.

Seguridad del árbol de Navidad

En estas fiestas, sea consciente de los posibles incendios al decorar las salas. Una pequeña llama que llegue a un árbol de Navidad puede crecer muy rápido.

ELEGIR EL ÁRBOL

- Elija un árbol con agujas de pino verdes y frescas que no se desprendan con el contacto.

COLOCAR EL ÁRBOL

- Antes de colocar el árbol en la plataforma, corte 2" de la base del tronco.
- Asegúrese de que el árbol esté alejado, al menos tres pies (un metro), de cualquier fuente de calor, como chimeneas, calefactores, velas, conductos de calefacción o lámparas.
- Asegúrese de que el árbol no obstruya una salida.
- Agregue agua a la base del árbol. Asegúrese de agregar agua a diario.

ENCENDER EL ÁRBOL

- Use luces avaladas por un laboratorio calificado. Algunas luces son solo para interiores y otras solo para exteriores.
- Reemplace las guirnaldas luminosas que tengan cables deteriorados o rotos, o conexiones flojas en las bombillas. Lea las instrucciones del fabricante para saber el número de guirnaldas a colocar.
- Nunca use velas encendidas para decorar el árbol.
- Siempre apague las luces del árbol de Navidad antes de salir o al irse a dormir.

Después de Navidad

Deshágase del árbol después de Navidad o cuando este se seque. Los árboles secos representan un peligro de incendio y no se deben dejar en el hogar o en el garaje, o afuera junto a la casa.

Consulte con su comunidad local para buscar un programa de reciclaje.

Entre al hogar las luces eléctricas exteriores después de las fiestas para prevenir riesgos y darles más vida útil.

DATOS

- **Uno de cada cuatro** incendios de árboles navideños en el hogar son provocados por problemas eléctricos.
- Aunque los incendios de árboles navideños no son comunes, cuando suceden, lo más probable es que sean graves.
- Una fuente de calor muy cerca del árbol provoca alrededor de **uno de cada cuatro** incendios.

Su fuente de Información de SEGURIDAD
División de Educación Pública (Public Education Division) **de NFPA.** • 1 Batterymarch Park, Quincy, MA 02169

Christmas Tree Safety

As you deck the halls this holiday season, be fire smart. A small fire that spreads to a Christmas tree can grow large very quickly.

PICKING THE TREE

- Choose a tree with fresh, green needles that do not fall off when touched.

PLACING THE TREE

- Before placing the tree in the stand, cut 2" from the base of the trunk.
- Make sure the tree is at least three feet away from any heat source, like fireplaces, radiators, candles, heat vents or lights.
- Make sure the tree is not blocking an exit.
- Add water to the tree stand. Be sure to add water daily.

LIGHTING THE TREE

- Use lights that have the label of a recognized testing laboratory. Some lights are only for indoor or outdoor use.
- Replace any string of lights with worn or broken cords or loose bulb connections. Read manufacturer's instructions for number of light strands to connect.
- Never use lit candles to decorate the tree.
- Always turn off Christmas tree lights before leaving home or going to bed.

After Christmas

Get rid of the tree after Christmas or when it is dry. Dried-out trees are a fire danger and should not be left in the home or garage, or placed outside against the home.

Check with your local community to find a recycling program.

Bring outdoor electrical lights inside after the holidays to prevent hazards and make them last longer.

FACTS

- **One** of every three home Christmas tree fires is caused by electrical problems.
- Although Christmas tree fires are not common, when they do occur, they are more likely to be serious.
- A heat source too close to the tree causes roughly **one in every four** of the fires.

NATIONAL FIRE PROTECTION ASSOCIATION
The leading information and knowledge resource on fire, electrical and related hazards

